Technology Demonstration Summary Sheet
Pipe Crawler Radiological Surveying System?

THE NEED

Embedded and exposed piping represents a major problem set in both federal (e.g., U.S. DOE) and commercial radiological D&D programs. Piping systems are difficult to survey by conventional technologies, and, in the absence of accurate survey data, may require presumptive excavation and/or dismantlement in order to remove the question of unacceptable residual contamination. Accurate surveying technologies that are acceptable to regulators are needed for surveying piping systems to support action decisions, including unrestricted release, and for avoiding unnecessary removal, or allowing reuse of piping systems.

THE TECHNOLOGY

Pipe Crawler was developed by Radiological Services, Inc., for use as part of a turn-key pipe inspection, decontamination and survey service. The technology consists of a wheeled robot, or mule, on which is mounted an array of thin G-M detectors. The crawler is manually transported through pipes using flexible fiberglass rods. If piping systems are accessible from both ends, up to 200 feet of pipe, including multiple bends, can be surveyed. Crawlers have been build for pipes as small as 2 inch to as large as 18 inch internal diameter.

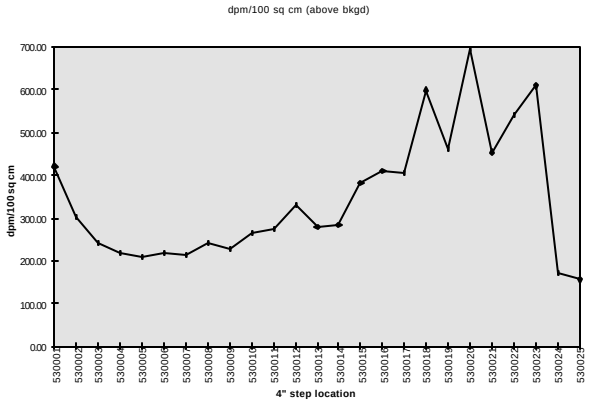
Pipe Crawler used for 5- and 6-inch rod storage holes

THE DEMONSTRATION

Pipe Crawler was demonstrated in December 1996 at Argonne National Laboratory's CP-5 reactor as part of DOE's Large Scale Demonstration Program. Surveys were conducted primarily in the rod storage holes, along with portions of a pair of 12-inch vent lines servicing the reactor area. Several rod storage holes each of 5-, 6- and 12-inch diameter and 10- to 17-foot depth were surveyed, along with about 40 feet of the combined vent lines. All surveys were preceded by a recorded video inspection, but without the benefit of any pipe pre-decontamination.

THE RESULTS

Survey measurements in counts-per-second were recorded in stepwise fashion. Detector calibrations using a Co-60 source were applied for suspected activation products in iron and steel. Detectability was assured by using ample counting duration (usually 1 min/step). Recorded count rate and survey location data were converted post-run to dpm/100 sq.cm. The lowest count rates in pipes were used as working background reference points. The technology functioned without significant problems and at expected through-puts. An example of survey results for 5-inch rod hole number 30 is given below:



CONTACTS

- Dick Baker, Project Manager, U.S. Department of Energy, Chicago Operations Office, (630) 252-2647
- Steve Bossart, D&D Focus Area Manager, U.S. Department of Energy, FETC, (304) 285-4643
- Terry Bradley, Alliance Administrator, Duke Engineering & Services, (704) 382-2766.
- Kurt Picel, Test Engineer, Argonne National Laboratory, (630) 252-4018
- Jim McCleer, President, Radiological Services, Inc., (203) 437-4843